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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the molding public-funds type used for shaping, such as vehicles, such as a car and a rail car, minerals for construction, and a textiles system sound insulating material of \*\*\*\*\*.

[0002]

[Description of the Prior Art] As this kind of a molding public-funds type, conventionally, The molding public-funds type which consists of an up-and-down metallic mold of the couple which it had, respectively is known, and a hot-forming part so that it may be indicated by JP,1-15619,B in this metallic mold. By a hot-forming part, compression molding of the inorganic fiber fleece to which the unhardened thermosetting resin binder was made to adhere is carried out to predetermined sound insulating material shape by a heated state. In JP,56-37373,A, what was made to carry out heat cure of the inorganic fiber fleece of a compression state for a short time in the molding part is indicated by providing a hot wind through-hole in a molding public-funds type molding part, and blowing a hot wind into a molding part via this hot wind through-hole.

[0003]

[Problem(s) to be Solved by the Invention] However, it not only takes time for there to be inconvenience which a sound insulating material is complicated shape, and cycle time cannot do short in response to restrictions of a heavy-gage part when a heavy-gage part and a thin-walled part exist in the case of the former, and to heat the whole, but it had the inconvenience of being easy to produce shaping nonuniformity. Since a hot wind is supplied to the whole molding part from the hot wind through-hole provided in the molding part of the metallic mold in the case of the latter, A sound insulating material is complicated shape, when a heavy-gage part and a thin-walled part exist, superfluous quantity of heat is supplied to a thin-walled part, and there is a problem of discoloration of a binder not arising, or the quantity of heat of a heavy-gage part being insufficient, and a binder not hardening. This invention solves the technical problem of said conventional technology, and an object of this invention is to provide the molding public-funds type which can be fabricated efficiently, even if it is molded products, such as a complicated-shaped sound insulating material.

[0004]

[Means for Solving the Problem] In a molding public-funds type which consists of an up-and-down metallic mold of a couple provided with a hot-forming part, respectively so

that a molding public-funds type of this invention may attain said purpose, A hot wind through-hole is allocated in a heavy-gage part shaping part in each hot-forming part of said up-and-down metallic mold, and it enabled it to make said heavy-gage part shaping part pass a hot wind. A hot wind passage by which section forming was carried out is established in two or more compartments which are mutually open for free passage in each metallic mold of said up-and-down metallic mold, and it may be made to discharge a hot wind from supply and a hot wind through-hole of a hot wind to a hot wind through-hole via this hot wind passage. A pushing-out edge may be formed in a periphery of a hot-forming part of said up-and-down metallic mold.

[0005]

[Function]

(1) The cycle time currently governed by the heavy-gage part can be conventionally shortened to the cycle time grade of a thin-walled part by not providing a hot wind through-hole all over the molding part of a metallic mold, but providing a hot wind through-hole only in the heavy-gage part shaping part of a hot-forming part, and sending a hot wind. Since respectively suitable quantity of heat can be given to a heavy-gage part and a thin-walled part, shaping nonuniformity is not produced, either.

(2) When it is considered as the compartment structure which opens the hot wind passage in a metallic mold for free passage mutually, supply of a hot wind can be controlled so that a hot wind is efficiently supplied to the compartment which is open for free passage to a hot wind through-hole.

(3) If it is considered as the compartment structure which opens the hot wind passage in a metallic mold for free passage mutually, the intensity of a hot wind passage, i.e., the intensity of the metallic mold itself, improves, and since the press intensity at the time of carrying mold goods through with a pushing-out edge can be borne, even if it forms a pushing-out edge, there will be no distortion and modification of a metallic mold.

[0006]

[Example]Next, the example of this invention is described with reference to drawings. Ten in a figure shows an upper mold, 20 shows the Shimokane type, and these up-and-down metallic molds 10 and 20 are provided with the hot-forming parts 11 and 21, respectively. It has come to be able to carry out the heating compression molding of the inorganic fiber fleece 30 to which the unhardened thermosetting resin binder was made to adhere by these hot-forming parts 11 and 21 by which heating control is carried out to desired temperature with the heaters 12 and 22 allocated in the metallic mold 10 and 20 to the mold compact of desired shape.

[0007]The hot wind through-holes 13 and 23 are formed in the heavy-gage part shaping parts 11a and 21a of the hot-forming parts 11 and 21 of said up-and-down metallic molds 10 and 20. As for these hot wind through-holes 13 and 23, the number of necessity pieces provided a thing about 5 mm in diameter in a 20-mm pitch. The hot wind passages 14 and 24 which are open for free passage to said hot wind through-holes 13 and 23 are established in the inside of each metallic molds 10 and 20, and these hot wind passages 14 and 24, While section forming is carried out to the compartments 16 and 26 of six rooms by the septa 15 and 25, respectively, the whole division drawing rooms 16 and 26 are opened for free passage by the communicating holes 17 and 27 where each compartments 16 and 26 were formed in the septa 15 and 25.

[0008]While the hot wind feed pipe 28 is opened for free passage by the hot wind

passage 24 of Shimokane type 20, the hot wind exhaust pipe 18 is opened for free passage by the hot wind passage 14 established in the upper mold 10. In this example, to the hot wind passage 24 of Shimokane type 20, the hot wind feed pipe 28 is opened for free passage by the compartments 26, 26, and 26 close to the hot wind through-hole 23, respectively, and the hot wind was efficiently supplied to the heavy-gage part shaping part 21a of the hot-forming part 21. To the hot wind passage 14 of the upper mold 10, the hot wind exhaust pipe 18 is opened for free passage by the compartments 16, 16, and 16 close to the hot wind through-hole 13, respectively, and the hot wind was efficiently discharged from the heavy-gage part shaping part 11a of the hot-forming part 11. In the inside 18a and 28a of a figure, an air-flow-rate-control damper is shown.

[0009]The pushing-out edges 19 and 29 are formed in the periphery of the hot-forming parts 11 and 21 of the up-and-down metallic molds 10 and 20, and it enabled it to perform trim processing simultaneously in this example.

[0010]Next, it explains per example of manufacture of the sound insulating material using said molding public-funds type. The example of a graphic display shows the example of manufacture of the hood insulator of a car. First, the prepreg-like glass fiber fleece to which aquosity phenol resin was made to adhere about 10% of the weight with a spray gun was prepared for the fiber diameter of 7 micrometers, and about 30 mm of fiber length's glass fiber as the inorganic fiber fleece 30. The surface density of the obtained glass fiber fleece was  $500 \text{ g/m}^2$ , and average thickness was about 100 mm. In this example, the skin material 31 made of the polyester nonwoven fabric of eyes  $50 \text{ g/m}^2$  was put on the upper surface of said glass fiber fleece 30.

[0011]Next, the inorganic fiber fleece 30 which equipped this upper surface with the skin material 31 is arranged between the hot-forming part 11a of the up-and-down metallic molds 10 and 20 heated by  $200^\circ\text{C}$  with the heaters 12 and 22, and 21a, While pressurizing with the compacting pressure of  $2.9 \text{ kg/cm}^2$ , the  $200^\circ\text{C}$  hot wind supplied with the air capacity for  $50\text{-m}^3/\text{was}$  supplied to the hot wind passage 24 of Shimokane type 20 via the hot wind feed pipe 28 from the hot wind supply source of figure abbreviation.

[0012]The hot wind supplied from the hot wind feed pipe 28 in this way, The hot wind through-hole 23 provided in the heavy-gage part shaping part 21a of the hot-forming part 21 via the hot wind passage 24 of Shimokane type 20 is supplied, Between the hot-forming parts 11 and 21, a hot wind is passed in order of the inorganic fiber fleece 30 of a compression state, and the skin material 31, Then, it is exhausted out of the upper mold 10 via the hot wind through-hole 13, the hot wind passage 14, and the hot wind exhaust pipe 18 which were formed in the hot-forming part 11 of the upper mold 10, and is returned to a hot wind supply source. A hot wind flows into the next compartments 16 and 26 through the communicating holes 17 and 27 established in the septa 15 and 25 of the compartments 16 and 16 and the compartments 26 and 26 in the part without the hot wind through-holes 13 and 23, The up-and-down metallic molds 10 and 20 are uniformly heated with the heaters 12 and 22 embedded in the hot-forming parts 11 and 21. Next, the acquired Plastic solid was pierced and processed by the punching pressure of about  $200 \text{ kg/cm}$  using the pushing-out edges 19 and 29 in which it was provided by the same metallic molds 16 and 20.

[0013]Thus, it was obtained, and although the hood insulator was provided with an about 30-mm heavy-gage part and had complicated shape, in the cooking time of a short time

for about 30 seconds, it does not have shaping nonuniformity and hot forming was carried out uniformly.

[0014] Since section forming of the hot wind passages 14 and 24 is carried out to an a large number room and each compartments 16 and 26 are mutually opened for free passage by this example as mentioned above, It can supply a hot wind to the desired part of the metallic molds 10 and 20 efficiently, and, moreover, intensity not only improves, but can heat the metallic molds 10 and 20 uniformly to such an extent that the intensity of the metallic mold 10 and 20 the very thing can improve and the pushing-out edges 19 and 29 can be formed.

[0015] If the skin material 31 is not laminated to the inorganic fiber fleece 30, a hot wind blows in, and an upper mold, the Shimokane type from an upper mold, or neither is available for a direction from the Shimokane type, but when the skin material 31 turns up temporarily and an upper mold and a skin material turn from the Shimokane type down, it is preferred to blow in into the Shimokane type from an upper mold.

[0016]

[Effect of the Invention] Thus, according to the molding public-funds type of this invention, the following effects are acquired.

- (1) Cycle time can be shortened according to concomitant use with hot-platen press forming and hot wind penetration.
- (2) Efficient uniform quantity of heat can be supplied to the heavy-gage part and thin-walled part of a Plastic solid, and there are not discoloration by binder heating, a shortage of hardening of a binder, etc.
- (3) When the hot wind passage in a metallic mold is made into compartment structure, supply of a hot wind can be controlled so that a hot wind is efficiently supplied to the compartment which is open for free passage to a hot wind through-hole. The intensity of a hot wind passage, i.e., the intensity of the metallic mold itself, improves, and since the press intensity at the time of carrying mold goods through with a pushing-out edge can be borne, even if it forms a pushing-out edge, there are no distortion and modification of a metallic mold.

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CLAIMS

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[Claim(s)]

[Claim 1] A molding public-funds type characterized by allocating a hot wind through-hole in a heavy-gage part shaping part in each hot-forming part of said up-and-down metallic mold, and enabling it to make said heavy-gage part shaping part pass a hot wind in a molding public-funds type which consists of an up-and-down metallic mold of a couple provided with a hot-forming part, respectively.

[Claim 2] The molding public-funds type according to claim 1 establishing a hot wind passage by which section forming was carried out in two or more compartments which are mutually open for free passage in each metallic mold of said up-and-down metallic mold, and discharging a hot wind from supply and a hot wind through-hole of a hot wind to a hot wind through-hole via this hot wind passage.

[Claim 3] The molding public-funds type according to claim 1 or 2 forming a pushing-out edge in a periphery of a hot-forming part of said up-and-down metallic mold.

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[Translation done.]